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EXAMINER

RAINEY, ROBERT R

ART UNIT	PAPER NUMBER
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2629

NOTIFICATION DATE	DELIVERY MODE
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03/20/2009

ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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Office Action Summary	Application No. 10/582,780	Applicant(s) CRAVEN-BARTLE ET AL.	
	Examiner ROBERT R. RAINEY	Art Unit 2629	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 03 November 2008.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-50 is/are pending in the application.
- 4a) Of the above claim(s) 4-9 and 14-37 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-3, 10-13 and 38-50 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 13 June 2006 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☒ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>6/13/06, 8/28/08</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Election/Restrictions

1. Applicant's election without traverse of species 3 claims 1-3, 10-13, 29-33 and 38-50 in the reply filed on 11/03/2008 is acknowledged.
2. Claims 4-9, 14-28, and 34-37 withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected species, there being no allowable generic or linking claim. Election was made **without** traverse in the reply filed on 11/03/2008.
3. Examiner accepted the claims for examination as designated by applicants as reading on the elected species. However, the claims listed as being generic – 1-3, 10-13, 38-40 and 44-50 –, while generic in the sense that they are not necessarily incompatible with the other species, are not generic in the sense that allowance of one of them would mean that claims to the other species would necessarily be rejoined nor even that claims specific to the elected species would be allowed based solely upon allowance of one of these "generic" claims. This is the case because applicant seems to be pursuing several inventions that are useable together. For example, the processing of the image containing a portion of the stylus, the light trapping boresight, and the clamping of the boresight to the pcb using the leads of the LED, while useable together are also useable separately. For this action, in order to advance prosecution, and because it is not clear which inventions applicants intend to pursue as individual inventions that do

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not include the details of a base invention, examiner has treated all of the inventions.

4. Examiner notes that the specific structure of the elected species was not included in the priority documents dated December 15, 2003 and figures 14-19, which show specific structure of the elected species were not explicitly present in the priority documents dated July 8, 2004, which in examiner's copies show only a single black silhouette. If drawings 14-19 are referenced as providing support for a particular limitation, examiner requests that applicants also indicate where support may be found in the priority documents for that limitation.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. **Claims 1, 2, 10, 13, 38-48** are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 5,852,434 to *Sekendur* ("*Sekendur*").

As to **claim 1**, *Sekendur* discloses a writing instrument with absolute optical position determination, comprising: an irradiating system which has an optical axis within said irradiating system and includes a radiation source (see for example Fig. 7 item 17), and an imaging system

which has an optical axis within said imaging system and includes a two-dimensional radiation sensor (see for example Fig. 7 item 13), said imaging system being arranged to provide an image of an object being irradiated by said irradiating system, wherein said optical axis of the irradiating system and said optical axis of the imaging system are non-coinciding within said systems (see for example Fig. 7, note that the optical axis of the radiation source points down and left, while the optical axis of the two-dimensional radiation sensor points down) and mounting the two dimensional radiation sensor on a printed wiring board substrate (see for example Fig. 7 item 14 and 6:37-38).

Sekendur does not expressly disclose that said radiation source and said two-dimensional radiation sensor are mounted on a common substrate. However, the point of printed wiring board substrates such as seems to be indicated in Fig. 7 is to provide a common interconnection medium for the various electrical connections. Even though it would be possible to avoid connecting the radiation source to the same PWB as the radiation sensor, the configuration in which both the radiation source and the two-dimensional radiation sensor both connect to the same PWB would have been obvious to fairly suggested by one of ordinary skill in the art.

As to **claim 2**, in addition to the rejection of claim 1 over *Sekendur*, *Sekendur* further discloses that the irradiating system is arranged to

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redirect radiation from the radiation source (see for example Fig. 7 note the cup shape of the light source 17, which indicates a redirection of side emitted radiation into a more forward direction) and the imaging system is arranged to redirect radiation from the irradiated object towards the radiation detector (see for example Fig. 7, both items 12 and 20 are described at 6:30-35 as lenses, these redirect the radiation from the irradiated object towards the radiation detector).

As to **claim 10**, in addition to the rejection of claim 1 over *Sekendur*, *Sekendur* further discloses that the imaging system further comprises a sensor boresight unit for controlling a spatial origin of radiation transmitted towards the radiation sensor (see for example Fig. 7, note that at least the lenses, items 12 and 20, and the housing around the radiation sensor control the spatial origin of radiation transmitted towards the radiation sensor).

As to **claim 13**, in addition to the rejection of claim 10 over *Sekendur*, *Sekendur* further discloses that the sensor boresight unit comprises a lens for creating an image of adequate image quality on the radiation sensor (see for example Fig. 7, lenses items 12 and 20).

As to **claim 38** *Sekendur* discloses a writing instrument with optical input and in particular: a modular unit for an electronic pen having a

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writing implement (see for example Fig. 7 item 19), said modular unit comprising: a carrier with a receiver for the writing implement (see for example Fig. 7, the carrier is not made explicit but is a necessary part since without something to position the components they would not stay in place, also without a receiver the writing implement would fall out), a printed circuit board, a two-dimensional radiation sensor mounted on the printed circuit board (see for example Fig. 7 item 14 and 6:37-38), and an imaging unit which defines an image plane (see for example Fig. 7 at least items 12 and 20 which are described at 6:30-35 as lenses), wherein the carrier, the printed circuit board, and the imaging unit are joined together with the imaging unit facing the radiation sensor to locate the image plane at the radiation sensor (see for example Fig. 7, both items 12 and 20 are described at 6:30-35 as lenses, one skilled in the art would recognize that these are designed to transfer the images from the sensed object as shown in Fig. 1-5 to an image plane at the radiation sensor).

As to **claim 39**, in addition to the rejection of claim 38 over Sekendur, Sekendur further discloses that the imaging unit is designed to control the spatial origin of radiation reaching the radiation sensor (see for example Fig. 7, note that at least the lenses, items 12 and 20, and the housing around the radiation sensor control the spatial origin of radiation transmitted towards the radiation sensor).

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As to **claim 40**, in addition to the rejection of claim 38 over Sekendur, Sekendur further discloses a radiation source for illuminating an object plane defined by the imaging unit (see for example Fig. 7 item 17).

As to **claim 41**, in addition to the rejection of claim 40 over Sekendur, Sekendur further discloses or reasonably suggests to one of ordinary skill in the art at the time of the invention that the imaging unit comprises a holder for carrying the radiation source (see for example Fig. 7 item 17; note that if there were no holder to maintain the relationships between the items in Fig. 7 the items would not remain in their respective positions at least not in a gravitation field). A holder of some sort would also be required. Examiner interprets whatever holds the optical components in the desired arrangement as being part of the imaging unit.

As to **claim 42**, in addition to the rejection of claim 40 over Sekendur, Sekendur further discloses an electrical connection between the radiation source and the printed circuit board (see for example Fig. 7 especially the connection lines between the radiation source 17 and the PCB 14 and 6:37-38).

As to **claim 43**, in addition to the rejection of claim 41 over Sekendur:

Examiner takes official notice that the use of the electrical leads to clamp an assembly to a printed circuit board was well known in the art at the time of the invention. As evidence for this see for example U.S. Patent No. 3,649,939 to *Hildebrandt* Fig. 1-5, which shows a module comprised of a coil and holder with the leads of the coil clamping the module to a printed circuit board, or U.S. Patent No. 4,962,364 to *Okuya et al.* Fig. 1-2, which shows a more complex module with leads, "A", that supply power to an LED, formed to clamp the module to a printed circuit board.

At the time of invention, it would have been obvious to a person of ordinary skill in the art to use the known technique of using electrical leads, including the leads powering the radiation source, to clamp the holder as described in the rejections of the parent claims to the printed circuit board, since this improvement was known to have improved similar devices, that is modules attached to printed circuit boards.

The suggestion/motivation would have been to improve position retention or to reduce additional steps during manufacturing by a known technique (see for example *Hildebrandt* 1:10-60).

Thus it would have been obvious to one of ordinary skill in the art at the time of the invention to provide an electrical connection between the radiation source and the printed circuit board, wherein the electrical connection exerts a clamping force between the imaging unit and the printed circuit board.

As to **claim 44**, in addition to the rejection of claim 38 over Sekendur, Sekendur further discloses that the printed circuit board is supported by the carrier (the writing implement and the printed circuit board are maintained in a spatial relationship at least such that the printed circuit board is not separated from the device, whatever maintains this relationship causes them to move together thus the carrier supports the printed circuit board).

As to **claim 45**, in addition to the rejection of claim 38 over Sekendur, Sekendur further discloses that the printed circuit board is attached to the carrier (the writing implement and the printed circuit board are maintained in a spatial relationship, the printed circuit board must stay with the device in order for the device to work thus printed circuit board is attached to the carrier).

As to **claim 46**, in addition to the rejection of claim 38 over Sekendur, Sekendur further discloses that the imaging unit is supported by the printed circuit board (the imaging unit and the printed circuit board are maintained in a spatial relationship at least such that the printed circuit board is not separated from the device, whatever maintains this relationship causes them to move together thus the imaging unit is supported by printed circuit board).

As to **claim 47**, in addition to the rejection of claim 38 over Sekendur, Sekendur further discloses that the imaging unit is attached to the printed circuit board (the imaging unit and the printed circuit board are maintained in a spatial relationship, the printed circuit board must stay with the device in order for the device to work thus the imaging unit is attached to the printed circuit board).

As to **claim 48**, in addition to the rejection of claim 38 over Sekendur, Sekendur further discloses the modular unit comprising at least one connector for attaching at least part of an outer casing of said electronic pen (see for example Fig. 7 at least the line between item 24 and the rest of the device, the component is connected, which implies a connector).

7. **Claims 3, 11, 12, 29-33** are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 5,852,434 to *Sekendur* ("*Sekendur*") in view of U.S. Patent No. 7,098,894 to *Yang et al.* ("*Yang*").

As to **claim 3**, in addition to the rejection of claim 1 over *Sekendur*:
Sekendur does not expressly disclose that the optical axis within the irradiating system and the optical axis within the imaging system run essentially in parallel to each other

Yang discloses an optical input pen and in particular a system in which the irradiating and boresight optical axes run essentially in parallel to each other (see for example Fig. 5).

Sekendur and *Yang* are analogous art because they are from the same field of endeavor, which is optical input devices.

At the time of invention, it would have been obvious to a person of ordinary skill in the art to use the optical arrangement of *Yang*, having optical axes running essentially parallel to each other to replace the optical arrangement of *Sekendur*. The suggestion/motivation would have been to provide a device that is slim and able to be grasped by the hand (see for example *Yang* 4:60-65).

As to **claim 11**, in addition to the rejection of claim 10 over *Sekendur*:

Sekendur does not expressly disclose a radiation sensor mounted to a substrate in such a way that said mounting substantially fixes the position of the radiation sensor and causes it to move integrally with the substrate. (note that in *Sekendur* the sensor and source were mounted through at least somewhat flexible leads that allowed them to be located independently of the substrate location, within the bounds of the lead lengths and flexibility.)

Yang teaches an optical input device and discloses or reasonably suggests to one of ordinary skill in the art a radiation sensor mounted to a

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substrate in such a way that said mounting substantially fixes the position of the radiation sensor and causes it to move integrally with the substrate (see for example Fig. 5 in which sensor 14 appears to be mounted to item 15).

Sekendur and *Yang* are analogous art because they are from the same field of endeavor, which is optical input devices.

At the time of invention, it would have been obvious to a person of ordinary skill in the art to use the optical arrangement and mounting of *Yang*, having a right angle bend in the sensed radiation path and the sensor made to move integrally with a substrate to replace the optical arrangement of *Sekendur*. The suggestion/motivation would have been to provide a device that is slim and able to be grasped by the hand (see for example *Yang* 4:60-65).

Yang further discloses that the sensor boresight unit is mounted on the common substrate (see for example Fig. 5; note that if there were no holder, i.e. boresight, to maintain the relationships between the items in Fig. 5 the items would not remain in their respective positions at least not in a gravitation field). Examiner's reasoning is as follows: A holder of some sort would also be required in the combination. Examiner interprets at least whatever holds the optical components in the desired arrangement as being part of the boresight unit. In order to hold the sensor/substrate combination in place with respect to the other optical components the

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boresight must be mounted to the substrate even if that mounting occurs through the sensor.

As to **claim 12**, in addition to the rejection of claim 10 over *Sekendur*:

Sekendur does not expressly disclose that the sensor boresight unit comprises a mirror for redirecting radiation from the object towards the radiation sensor.

Yang discloses that the sensor boresight unit comprises a mirror for redirecting radiation from the object towards the radiation sensor (see for example Fig. 5 item 13b).

Arguments for analogous art and obviousness of the combination of *Sekendur* and *Yang* are the same as those used in claim 11.

As to **claim 29** *Sekendur* discloses a writing instrument with optical input and in particular: A sensor boresight unit for transmitting radiation from an object to a radiation sensor, said sensor boresight unit comprising: a housing, which provides an internal channel ... within said housing and further provides a radiation entrance end (see for example Fig. 7 item 12) and a radiation exit end of said channel (see for example Fig. 7 item 20), a lens (see for example Fig. 7 item 12), which is mounted in the internal channel at said radiation entrance end of said housing.

Yang teaches an optical input device and discloses an optical imaging system with an internal channel that changes direction at a turn within said housing (see for example Fig. 5), and a mirror (see for example Fig. 5 item 13b), which is mounted in the housing at said turn of the internal channel for redirecting radiation along the change of direction of the internal channel.

Arguments for analogous art and obviousness of combination are the same as for claim 3.

As to **claim 30**, in addition to the rejection of claim 29 over *Sekendur* and *Yang*, *Yang* further discloses an optical pen and in particular a radiation source held in a particular location and orientation with respect to an image capture section by a holder (see for example Fig. 5 item 11; note that if there were no holder to maintain the relationships between the items in Fig. 5 the items would not remain in their respective positions at least not in a gravitation field). A holder of some sort would also be required in the combination. Examiner interprets whatever holds the optical components in the desired arrangement as being part of the boresight unit, thus the combination teaches a boresight unit comprising a holder for a radiation source for illuminating said object.

As to **claim 31**, in addition to the rejection of claim 29 over *Sekendur* and *Yang*, *Yang* further discloses that said lens defines an

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image plane at said radiation exit end (see for example Fig. 5 noting the lines indicating the transfer of a point in the object plane to a point in the image plane)

Examiner takes official notice that aperture stops placed at various points in the optical path to prevent unwanted light from reaching the image plane were well known to those skilled in the art at the time of the invention.

Thus the addition of a barrier in said channel to screen said image plane from said radiation entrance end would have been obvious to one of ordinary skill in the art. Whether this barrier is part of the housing or a separate piece mounted in the housing does not affect patentability at least as presently claimed.

As to **claim 32**, in addition to the rejection of claim 31 over *Sekendur* and *Yang*, the barrier as taught in the art cited in claim 31 also represents a radiation trap since the radiation impinging upon it will be partially absorbed and partially reflected, and the reflected portion will then be subject to further partial absorption / partial reflection events at for example the channel-defining wall, which now become radiation traps guiding the undesired radiation away from the sensor. Thus the combination discloses that said housing defines at least one radiation trap in a channel-defining wall portion between said barrier and said radiation entrance end. In order to further prosecution, examiner notes that there

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are many types of radiation traps including absorptive coatings as well as redirection of radiation as seen for example in U.S. Patent No. 3,735,142 to Harr et al. (6:58-7:2). Applicant is encouraged to claim the details of the type of trap invented.

Claim 33, is rejected on the same grounds and arguments as claim 31 since that rejection covered the teaching that the housing defines an aperture stop in said channel.

8. **Claims 49-50** are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 5,852,434 to *Sekendur* ("*Sekendur*") in view of U.S. Patent Application Publication No. 2002/0163511 to *Sekendur* ("*Sekendur-2*").

As to **claim 49** *Sekendur* discloses a writing instrument with optical input and in particular: An electronic pen arrangement, comprising: a writing implement (see for example Fig. 7 item 9), an optical system which is designed to generate an image of a writing surface on which the pen is operated (see for example Fig. 7 at least item 12), and a processing unit (see for example Fig. 7 item 21) which is designed to derive data indicative of a position, based upon a position-coding pattern (see for example Fig. 1) in said image.

Sekendur-2 discloses a writing instrument with optical input and in particular: said image including part of a writing implement (see for

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example Fig. 2 or 3 and [0069]) and deriving data indicative of a position based upon the location of said part in the image (see for example Fig. 2 or 3 and [0069]).

Sekendur and *Sekendur-2* are analogous art because they are from the same field of endeavor, which is optical input devices.

At the time of invention, it would have been obvious to a person of ordinary skill in the art to improve the system of *Sekendur* by including the tip of the writing device as a point of reference in the image as taught by *Sekendur-2*. The suggestion/motivation would have been to provide a device with the advantages of additional locating techniques (see for example *Sekendur-2* [0095] "A virtual line can be traced by triangulating and/or pattern-matching other reference points and/or images on the surface, and/or by position-related code", which suggests that the various techniques can be used together).

As to claim 50, in addition to the rejection of claim 49 over *Sekendur* and *Sekendur-2*, *Sekendur-2* further teaches that said part is representative of a contact point between the writing implement and the writing surface (see for example [0065], [0075] and Fig. 2 noting particularly the indicated "writing element" 6).

Conclusion

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9. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

U.S. Patent No. 3,649,939 to Hildebrandt teaches a module comprised of a coil and holder with the leads of the coil clamping the module to a printed circuit board.

U.S. Patent No. 4,962,364 to Okuya et al. teaches a module with leads that supply power to an LED formed to clamp the module to a printed circuit board.

U.S. Patent No. 3,735,142 to Harr et al. teaches a pen-shaped probe with stray light trap (6:58-7:2 and Fig. 6).

U.S. Patent Application Publication No. 2003/0034961 to Kao teaches including the pen tip in the image to serve as a reference point in a system using a camera with coded paper to determine location ([0049], [0062]).

Any inquiry concerning this communication or earlier communications from the examiner should be directed to ROBERT R. RAINEY whose telephone number is (571)270-3313. The examiner can normally be reached on Monday through Friday 8:30 AM to 5:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Amare Mengistu can be reached on (571) 272-7674. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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/RR/

/Amare Mengistu/
Supervisory Patent Examiner, Art Unit 2629